(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 459 419 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **91108728.6**

(51) Int. Cl.5: **H04N 7/15**

(22) Date of filing: **28.05.91**

(30) Priority: **30.05.90 JP 140554/90**

(43) Date of publication of application:
04.12.91 Bulletin 91/49

(84) Designated Contracting States:
DE FR GB

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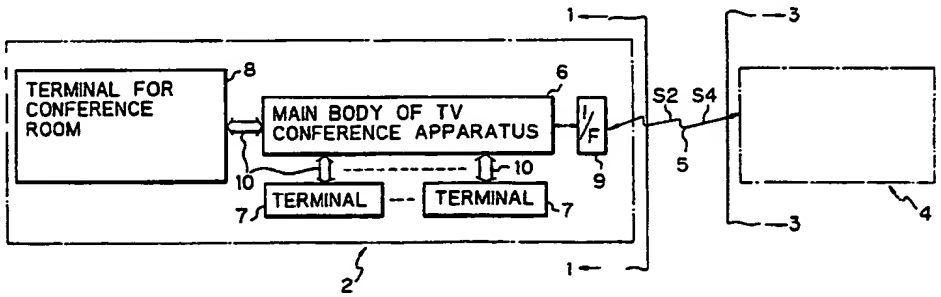
(54) Television conference system.

(57) A television conference system in which video information and audio information are transmitted between a first conference hall (1) and a second conference hall (3), video information and audio information from a first video camera (14-16) and a first microphone in the first conference hall (1) are monitored at the second conference hall (3), video information and audio information from a second video camera and a second microphone in the second conference hall (3) are monitored at the firs conference, a plurality of personal terminals (7) having at least information input means (12) and monitor section (11) for monitoring given information are provided in the first and second conference halls (1,3), and information signal derived from any of the personal terminals (7) is monitored by one or more specific personal terminal (7).

Fig. 1



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BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a television conference system, in which video information and audio information are transmitted between first and second conference halls.

Description of the Prior Art

Conventionally, various kinds of television conference systems have been proposed. According to a television conference system, in general, video information which is displayed by a monitor and audio information which is transmitted by a speaker are mainly used, such as described in Japanese Patent Publication Unexamined No. 60-116293 or No. 62-245889.

In the conventional television conference system, video information and audio information are transmitted in the bidirections as information of the whole conference hall. Very little consideration is made with regard to an individual information exchange among attendants of the conference or between the attendants of the conference and non-attendants. Accordingly, there is a problem such that it is impossible that a certain attendant sends a message to a specific attendant in a manner such that the massage cannot be known by persons other than the specific attendants during a conference. On the other hand, there is a problem such that a progress of a conference is obstructed in the case where a secretary makes contact to an attendant by an emergent business matter.

OBJECTS AND SUMMARY OF THE INVENTION

It is, therefore, an object of the invention to provide a television conference system in which information can be exchanged between at least arbitrary two persons among attendants of a conference.

To accomplish the object of the invention, there is provided a television conference system in which video information and audio information are transmitted between a first conference hall and a second conference hall, comprising; a first video camera and a first microphone provided in the first conference hall, a second video camera and a second microphone provided in the second conference hall, a first monitor means provided in the first conference hall, for monitoring video information and audio information sent from the second video camera and the second microphone, a second monitor means provided in the second conference hall, for monitoring video information and audio information sent from the first video camera and the first microphone, a plurality of personal terminals provided in the first and second conference halls, having at least information input means and monitor section for monitoring given information signal, respectively, and control means for supplying information signal derived from any of the plurality of personal terminals to one or more specific the personal terminal.

The above, and other, objects, features and advantages of the present invention will become readily apparent from the following detailed description thereof which is to be read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing a construction of an embodiment of a television conference system according to the invention;

Fig. 2 is a diagram showing an example of a personal terminal using in a system of Fig. 1; and

Fig. 3 is an explanatory diagram showing a scene of a conference hall having a system of Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the present invention will be described with reference to Figs. 1 to 3. In a construction of Fig. 1, a television conference system comprises; a conference hall system 2 provided in a conference hall 1; and another conference hall system 4 provided in another conference hall 3. Both of the conference hall systems 2 and 4 are connected through a transmission line 5.

The conference hall system 2 is mainly constructed by a television conference apparatus main body 6, personal terminals 7, a conference room terminal 8, and an interface 9. The personal terminals 7, conference room terminal 8, and the like are connected to the television conference apparatus main body 6 by system buses 10. Since the other conference hall system 4 is constructed and operates in substantially the same manner as those of the conference hall system 2, the overlapped explanations are omitted.

The television conference apparatus main body 6 comprises various kinds of control means including, for example, a codec (not shown) and has a function to control the whole operation of the conference hall system 2. Control signals formed by the television conference apparatus main body 6 are supplied to the personal terminals 7, conference room terminal 8, and the other conference hall system 4 and those are controlled according to

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the control signal. On the other hand, video signals from video cameras of the conference room terminal 8 mentioned above, audio signals from microphones, and message data added with ID numbers which are supplied from the above personal terminals 7 are mixed by a control circuit (not shown) provided in the television conference apparatus main body 6 and the mixed data is supplied to the codec (not shown).

The codec of the television conference apparatus main body 6 comprises an encoder and a decoder. The encoder of the codec encodes the signal in which the video signal in the above conference hall 1, the audio signal in the conference hall 1, and the message data added with ID numbers of a transmitting person and a terminating person have been mixed into a signal S2 having a predetermined format. The encoded signal S2 is transmitted to the other conference hall system 4 through the interface 9 and transmission line 5 under the control of the control circuit (not shown) provided in the television conference apparatus main body 6.

On the other hand, the decoder of the codec of the television conference apparatus main body 6 receives and decodes a signal S4 which is encoded by an encoder of the television conference apparatus main body of the other conference hall system 4. It is required the system 4 to create and transmit the signal S4 using a control circuit (not shown). The decoded signal from the decoder is separated into the video signal, audio signal, and message data added with an ID number by the control circuit provided in the television conference apparatus main body 6, respectively. The video and audio signals derived are supplied to the conference room terminal 8. The video signal, audio signal, message data, and the like obtained are supplied to each of the personal terminals 7.

The personal terminal 7 is as shown in, for example, Fig. 2 and mainly comprises: a monitor section 11 to display a video image; a keyboard section 12 to input data; and a light pen 13. A tablet device having a hand writing input function can be also used as a keyboard section 12 mentioned above. The video signal which has been decoded and separated from the signal S4 is supplied to the monitor section 11 and a scene of the other conference hall 3 is displayed onto the screen of the monitor section 11.

As shown in Fig. 3, the conference room terminal 8 comprises: video cameras 14 to 16 to image pick-up the scene of the conference hall 1; a monitor 17 of a large screen; a microphone (not shown) to collect voice sounds of attendants 18a to 18e; a speaker (not shown); and the like. The video signal decoded and separated from the signal S4 is supplied to the monitor 17 and the scene of the other conference hall 3 is displayed. A voice sound at the other conference hall 3 is broadcasted from the speaker on the basis of the audio signal decoded and separated from the signal S4.

The operation of the television conference system will now be described. As shown in Fig. 3, personal terminals 70 to 74 are equipped on a desk 19 in the conference hall 1 and personal terminals 75 to 79 are also equipped on a desk 20 even in the other conference hall 3. Attendants 18a to 18e and 21a to 21e of the conference are seated in front of personal terminals 70 to 74 and 75 to 79.

The conference hall systems 2 and 4 are set to an operating mode by manipulating the television conference apparatus main bodies 6 of both of the conference hall systems 2 and 4. The scene of the conference hall 1 is image picked up by the video cameras 14 to 16 provided as conference room terminals 8. The scene of the whole conference hall 1 is picked up by a plurality of video cameras 14 to 16. In the example shown in the diagram, the attendants 18c, 18d, and 18e are image picked up by the video camera 14; the attendants 18b, 18c, and 18d are image picked up by the video camera 15; and the attendants 18a and 18b are image picked up by the video camera 16. The video images of three frames derived from video cameras 14, 15 and 16 are synthesized by the control circuit in the television conference apparatus main body 6 and the video signal is obtained.

Individual speeches of the attendants 18a to 18e are collected by the microphone and the audio signal is obtained. The video signal and the audio signal are mixed by the control circuit (not shown) in the television conference apparatus main body 6. The mixed signal is encoded to the signal S2 by the encoder and is supplied to the other conference hall system 4 through the interface 9 and the transmission line 5.

Similarly, the encoded signal S4 is transmitted to the television conference apparatus main body 6 of the conference hall system 2 through the transmission line 5 by the television conference apparatus main body of the other conference hall system 4. The signal S4 is decoded by the codec in the television conference apparatus main body 6 of the conference hall system 2. The video signal and the audio signal are separated from the decoded signal S4 by the control circuit in the television conference apparatus main body 6 and are supplied to the conference room terminal 8 and the personal terminals 7, respectively.

Due to this, a whole scene of the other conference hall 3 is displayed as a video image on the monitor 17 of a large screen which is provided in the conference hall 1. The content of the speeches in the other conference hall 3 is broadcasted from the speaker. A scene in which the attendants 21a

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to 21e in the other conference hall 3 are seated in front of the personal terminals 75 to 79 is displayed onto the screen of the monitor 17. Although not shown, a scene of the conference hall 1 is also similarly displayed as a video image at the other conference hall 3.

In addition, the same scene as that on the monitor 17 is also displayed onto the screen of the monitor section 11 of each of the personal terminals 70 to 74 on the conference hall 1 side. In this case, since the same scene is displayed in the monitor 17 and the monitor section 11 of each of the personal terminals 70 to 74, only either one of them is used and the other display can be stopped.

When, for example, the attendant 18a in the conference hall 1 wants to send a message to a specific attendant, for instance, the attendant 18d in the same conference hall 1 during the conference in a manner such that the message cannot be known by the attendants 18b, 18c, 18e, and 21a to 21e other than the attendant 18d, the attendant 18a inputs the message and the ID number of the personal terminal 73 of the attendant 18d from the keyboard section 12. In this case, the number of terminating persons can be set one or a plural value. ID number of the attendant 18a himself as a transmitting person can be also simultaneously input from the keyboard section 12 or can be also automatically added on the side of the personal terminal 70.

Data comprising ID numbers of the attendant 18a as a transmitting person and the attendant 18d as a terminating person, and a message is processed by the control circuit in the television conference apparatus main body 6 and is supplied to the personal terminal 73 of the attendant 18d. That is, the control circuit compares each of ID numbers added to the personal terminal respectively with the ID number, which is input by the transmitting personal terminal for specifying a terminating personal terminal, an information signal is sent to the specific personal terminal as a result of the comparison.

In the case where an attendant who wants to transmit a message exists in the other conference hall 3, a message and the ID numbers of the personal terminals 75 to 70 provided in the other conference hall 3 are input in a manner similar to that mentioned above.

The data comprising the ID numbers of the transmitting person and the terminating person and the message is processed by the television conference apparatus main body 6 of the conference hall 1. The video signal and the audio signal which are formed by the conference room terminal 8 and the personal terminal 7 and the message data added with the ID numbers of the transmitting person and the terminating person are mixed by the control circuit (not shown) in the television conference apparatus main body 6. The mixed signal is encoded to the signal S2 by the codec of the television conference apparatus main body 6. The signal S2 is transmitted to the other conference hall system 4 through the interface 9 and the transmission line 5.

After the signal S2 was decoded by the codec of the television conference apparatus main body of the other conference hall system 4, the video signal, audio signal, message data, and data showing ID number are separated by the control circuit in the television conference apparatus main body of the other conference hall system 4.

The separated video signal and the audio signal are supplied to the conference room terminal, that is, the monitor of a large screen and the speaker and each of the personal terminals 75 to 79 by the control circuit. Only the message data is supplied to an attendant who wants to transmit a message based on ID number, for example, the personal terminal 78 of the attendant 21d.

A control means can be provided in each of personal terminals, by which a received information is monitored only when a individual ID number is equal to a received ID number as a result of a comparison.

A message 22 is displayed on only the monitor sections 11 of the personal terminal 73 and 78 of the attendants 18d and 21d who want to transmit the message together with the number indicating the transmitting person, denomination, and the like.

The attendants 18d and 21d who received the message can speak on the basis of the message or can transmit a message of the reply to the attendant 18a as a transmitting person by a procedure similar to that mentioned above. By providing the personal terminal 7 for the use as a secretary, for example, it is possible to inform that an emergency telephone of an outside line is called from a secretary to the attendant 18a. Due to this, the message can be transmitted to one or a plurality of specific attendants in a manner such that the message cannot be known by persons other than the specific attendants. The message can be exchanged between at least arbitrary two persons. Since the message can be transmitted to only the special attendants, the progress of the conference is not disturbed.

Although the embodiment has been described with respect to an example in which the same video image as that of the monitor 17 of the large screen is displayed on the monitor section 11 of the personal terminal 7, the invention is not limited to such an example. For example, the content written on a blackboard, materials, or the like can be picked up by a video camera and displayed on the monitor section 11 of the personal terminal 7.

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On the other hand, although the embodiment has been described with respect to an example in which a message is displayed on the monitor section 11 of the personal terminal 7, the invention is not limited to such an example. For example, a small monitor to display a message can be also provided separately from the personal terminal 7.

According to the television conference system in the invention, a personal terminal having at least an information input section and a monitor section and personal information monitor means for enabling information input from the information input section to be exchanged between at least arbitrary two persons are provided. Therefore, there is an effect such that a certain attendant can send a message to one or a plurality of special attendants in a manner such that the message cannot be known by persons other than the special attendants. There is an effect such that since a message can be transmitted to only specific attendants, a progress of the conference is not disturbed.

Having described a specific preferred embodiment of the present invention with reference to the accompanying drawings, it is to be understood that the invention is not limited to that precise embodiment. and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or the spirit of the invention as defined in the appended claims.

Claims

1. A television conference system in which video information and audio information are transmitted between a first conference hall (1) and a second conference hall (3) comprising:
   a) a first video camera and a first microphone provided in said first conference hall (1);
   b) a second video camera and a second microphone provided in said second conference hall (3);
   c) a first monitor means (17) provided in said first conference hall (1), for monitoring video information and audio information sent from said second video camera and said second microphone;
   d) a second monitor means provided in said second conference hall (3), for monitoring video information and audio information sent from said first video camera (14-16) and said first microphone;
   e) a plurality of personal terminals (7) provided in said first and second conference halls (1,3), having at least information input means (12) and monitor section (11) for monitoring given information signal, respectively, and
   f) control means for supplying information signal derived from any of said plurality of personal terminals (7) to one or more specific said personal terminal (7).

2. The system of claim 1, wherein each of said personal terminals (7) includes ID number input means for inputting an ID number of a destination personal terminal.

3. The system of claim 1, wherein each of said personal terminals (7) adds its own ID number to information signal from said information input means and then transmits the information signal.

4. The system of claim 1, wherein said control means compares each of ID numbers added to each of said personal terminals (7) with ID number from any of said personal terminals for specifying one or more terminating said personal terminal (7) and supplies said information signal thereto according to a result of comparison.

5. The system of claim 2, further comprising:
   a) transmitting means provided in said first conference hall, (1) for mixing and transmitting said video information, said audio information, ID number of said destination personal terminal and said information signal;
   b) means provided in said second conference hall, (3), for receiving a signal from said transmitting means and for separating said video information, said audio information, said ID number and said information signal, whereby said separated information signal is supplied to said destination personal terminal (7) responsive to said separated ID number.

6. A television conference system in which video information and audio information are transmitted between a first conference hall (6) and a second conference hall (3), comprising:
   a) a first video camera and a first microphone provided in said first conference hall (1);
   b) a second video camera and a second microphone provided in said second conference hall (3);
   c) a first monitor means (17) provided in said first conference hall, for monitoring video information and audio information sent from said second video camera and said second microphone;
   d) a second monitor means provided in said

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second conference hall, (3), for monitoring video information and audio information sent from said first video camera (14-16) and said first microphone;

e) a plurality of personal terminals (7) provided in said first and second conference halls (13), having at least information input means (12) and monitor section (11) for monitoring given information signal, respectively, wherein said personal terminals monitor said information signal, subject to allowance for monitoring information signal supplied from any of said personal terminals (7).

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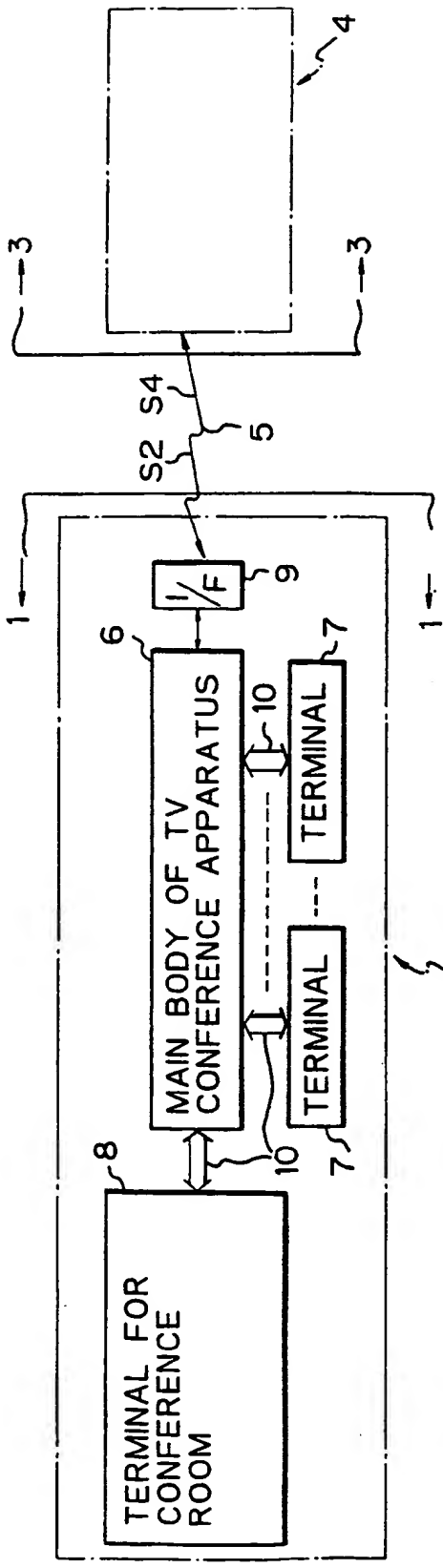
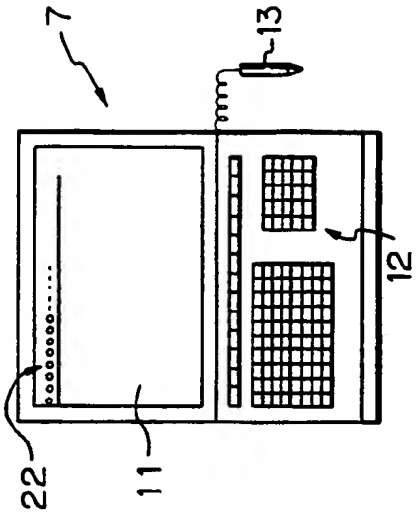

4
3
3
S4
S2
5
1
1
I/F
9
6
7
MAIN BODY OF TV CONFERENCE APPARATUS
10
TERMINAL
TERMINAL
10
7
8
TERMINAL FOR CONFERENCE ROOM
2

Fig. 1


7
13
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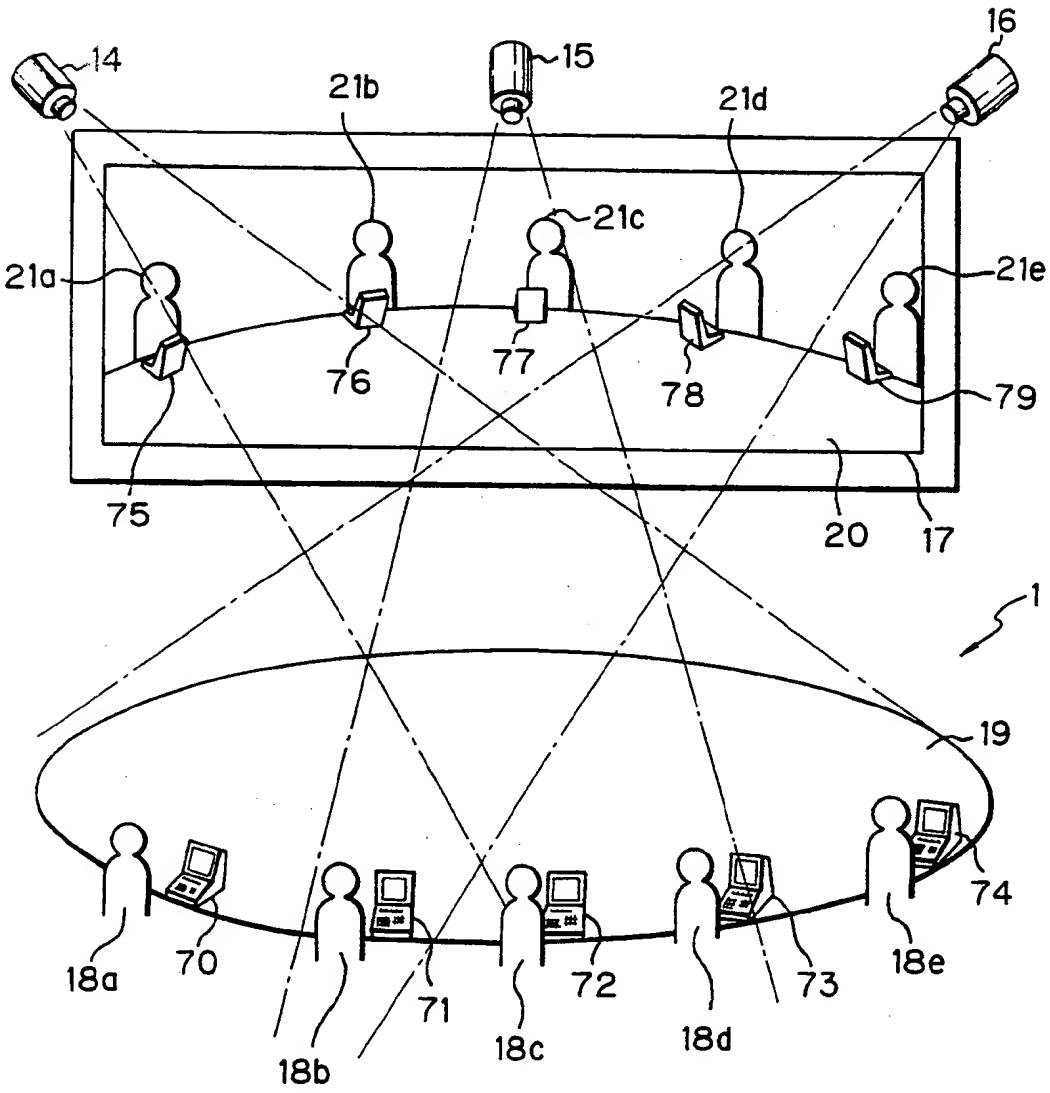
11

Fig. 2

Fig. 3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04.12.91 Bulletin 91/49

(84) Designated Contracting States:
DE FR GB

(88) Date of deferred publication of the search report:
26.08.92 Bulletin 92/35

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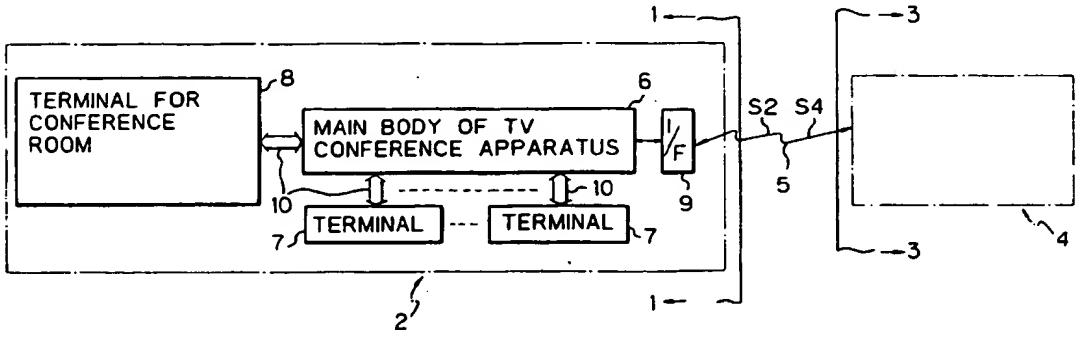
Fig. 1



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EUROPEAN SEARCH REPORT

Application Number

EP 91 10 8728

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	TELECOM 87 REPORT (JOURNAL OF ELECTRONIC ENGINEERING) 1987, TOKYO (JAPAN) pages 45 - 46; YASUHIRO HIGASHIDE ET AL: 'TELECONFERENCE SYSTEM' * paragraph " system structure" * * figure 1 *	1,6	H04N7/14
A	PATENT ABSTRACTS OF JAPAN vol. 13, no. 181 (E-750)27 April 1989 & JP-A-1 007 791 (NEC CORP.) 11 January 1989 & US-A-4 961 211 * abstract *	1-3,5,6	
A	EP-A-0 351 757 (HITACHI LTD.) * column 1, line 42 - line 51 * * column 4, line 4 - line 36; figure 2 *	1,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H04N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 JUNE 1992	FUCHS P.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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